


```

*      |      | Running (4) | <----->+
*      |      +-----+
*      |      |         |
*      |      |         v
*      |      +-----+
*      +----> | Pending  |
*              | Shutdown (5)|
*              +-----+
*              |         |
*              |         v
*              +-----+
*              | Dead (6)  |
*              +-----+
* </pre>
*
* Note the following:
* <ul>
*   <li>Any state can go to PENDING_SHUTDOWN. That is because streams can be closed at any time.</li>
*   <li>State PENDING_SHUTDOWN may want to transit to some other states other than DEAD,
*     in the corner case when the shutdown is triggered while the thread is still in the rebalance
loop.
*     In this case we will forbid the transition but will not treat as an error.
*   </li>
*   <li>State PARTITIONS_REVOKED may want transit to itself indefinitely, in the corner case when
*     the coordinator repeatedly fails in-between revoking partitions and assigning new partitions.
*     Also during streams instance start up PARTITIONS_REVOKED may want to transit to itself as well.
*     In this case we will forbid the transition but will not treat as an error.
*   </li>
*   <li>Any state which is considered running (i.e. STARTING, RUNNING, PARTITIONS_REVOKED,
PARTITIONS_ASSIGNED) could transition
*     to and from DISCONNECTED status. This state indicates that the StreamThread is alive and well,
but the connection to
*     broker does not exist.
*   </li>
* </ul>
*/
public enum State implements ThreadStateTransitionValidator {
    CREATED(1, 5), STARTING(2, 5, 6), PARTITIONS_REVOKED(3, 5, 6), PARTITIONS_ASSIGNED(2, 4, 5, 6), RUNNING
(2, 5, 6), PENDING_SHUTDOWN(6), DISCONNECTED(2,3,4,5), DEAD;

    private final Set<Integer> validTransitions = new HashSet<>();

    State(final Integer... validTransitions) {
        this.validTransitions.addAll(Arrays.asList(validTransitions));
    }

    public boolean isRunning() {
        return equals(RUNNING) || equals(STARTING) || equals(PARTITIONS_REVOKED) || equals
(PARTITIONS_ASSIGNED) || equals(DISCONNECTED);
    }

    @Override
    public boolean isValidTransition(final ThreadStateTransitionValidator newState) {
        final State tmpState = (State) newState;
        return validTransitions.contains(tmpState.ordinal());
    }
}

```

This would also mean that a new method would be added to KafkaConsumer to allow the StreamThread to query the health of the connection.

KafkaConsumer#isConnected()

```
/**
 * @return whether or not the connection is alive
 */
public boolean isConnected();
```

Proposed Changes

We would query individual StreamThreads for their individual status and update the state accordingly.

Compatibility, Deprecation, and Migration Plan

This would not have any compatibility issues with previous versions. Changes are internalized and since the version of messages are not a concern, no upgrade path should be necessary.